



# Explanatory Document

Exposure draft of the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment (Production Variables Update) Rules (No.2) 2023*.

## About this document

This document explains the draft amendments set out in the exposure draft *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment (Production Variables Update) Rules (No.2) 2023* (the draft Amendment).

## Background

### The Safeguard Mechanism

The Safeguard Mechanism provides a robust, legislated framework that limits the net emissions of around 215 large industrial facilities—those with more than 100,000 tonnes carbon dioxide equivalent each year. It sets legislated limits—known as baselines—on the greenhouse gas emissions of these facilities. These baselines will decline, predictably and gradually, on a trajectory consistent with achieving Australia’s emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050. The Safeguard Mechanism commenced in 2016. It was reformed in 2023 to ensure that covered facilities contribute to meeting these emission reduction targets, while strengthening their competitiveness as the world moves to net zero.

These reforms were implemented through the *Safeguard Mechanism (Crediting) Amendment Act 2023*, and the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment (Reform) Rules 2023*, which amends the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (the Safeguard Rule). The reforms came into effect from 1 July 2023. Updates to production variables and to set international best practice benchmarks were foreshadowed during the reform process.

The Safeguard Rules provide detail on aspects of the Safeguard Mechanism, including the setting and decline of baselines, and arrangements for Safeguard Mechanism credit units (SMCs), which are issued to facilities with emissions below Safeguard baselines.

The first set of updates to production variables came into effect on 7 October 2023.

This draft Amendment includes new production variables, changes to existing production variables, and international best practice benchmarks, as well as technical policy changes to mitigate the risk of inadvertent outcomes. The draft Amendment delivers within the carbon budget set under the *National Greenhouse and Energy Reporting Act 2007* (the NGER Act).

## Production Variables

Under the Safeguard Mechanism, baselines are production-adjusted, meaning that they increase and decrease as a facility's production varies. Production variables are defined under the delegated Safeguard Mechanism legislation as the production units which set each facility's baseline.

Production variables and default emissions intensity values are used to set existing facility baselines. They represent the output of a facility (e.g. tonnes of aluminium). Where it is impractical to use output for a production variable metric, a facility input or intermediate product is sought as an alternative.

As part of implementing the Safeguard Mechanism reforms, the draft Amendment makes technical changes to add new production variable definitions, updates existing production variable definitions and sets new or updated industry average emissions intensities (also referred to as default emissions intensities) to ensure a comprehensive set of suitable production variables is in place for setting Safeguard Mechanism baselines. This is intended to ensure production variable definitions support incentives for decarbonisation.

In summary, the draft Amendment:

- Amends the steel production variables to ensure the definitions are technologically neutral and broadly applicable;
- Amends the rail transport definition to be technology-neutral, relevant to four rail production variables;
- Amends the sodium cyanide production variable so that it can include sodium cyanide manufactured using caustic soda imported to a facility;
- Amends the definition of 'intermediate nickel products', relevant to three nickel production variables;
- Inserts seven new production variables: mine rehabilitation, two hydrogen production variables, lithium ore, renewable diesel, renewable aviation kerosene, and exported steam related to the ethene production activity;
- Inserts six new default emissions intensity values for lithium hydroxide, lithium ore, mine rehabilitation, exported steam related to the ethene production activity, refined lead, and ethane;
- Updates six existing default emissions intensities for zinc-in-fume, ethene, polyethene, newsprint and three steel sector production variables (metallic iron, primary steel and pellets) to better reflect current industry conditions or changed production variable definitions; and
- Alongside the existing default value for the petroleum refining production variable, sets an updated default emissions intensity value that reflects the higher emissions intensity associated with meeting legislated sulfur standards for petrol. This default value may be used by a refinery complying with the sulfur standards.

The draft Amendment completes the production variable review process ensuring production variables are available for setting Safeguard facilities' baselines from 2023-24, the first compliance year of the reformed Safeguard Mechanism.

## International best practice benchmarks

Following public consultation from July to August 2023 on guidelines for setting international best practice benchmarks (the guidelines), the draft Amendment outlines best practice emissions intensity values for 20 benchmarks, including priority production variables. The best practice

emissions intensity values have been set in accordance with the guidelines. The Government anticipates setting a further tranche of international best practice benchmarks by mid-2024.

The Government considered emerging international methane emissions standards in setting the benchmark values for the production variables in the coal, oil and gas sectors. The Department compared the standards set in the UNEP's Metcoal Methane Partnership and Oil and Gas Methane Partnership 2.0 to the relevant draft benchmarks. By setting the benchmarks on the best facilities internationally, the method detailed in the updated guidelines results in standards more stringent than the emerging international methane emissions standards. Further detail is at **Attachment A**.

## Other amendments

The draft Amendment includes a number of technical amendments to the Safeguard Rule to better clarify the original policy intent and mitigate the risk of inadvertent outcomes:

- To clarify that if an existing facility does not have an emissions intensity determination in place, and the relevant best practice emissions intensity number has not been set, then the emissions intensity for that production variable is zero. This change would only impact a facility that is eligible to apply for an emissions intensity determination (because there was historical production) but chooses not to do so. It is designed to ensure compliance with the requirements of the scheme.
- Clarifying that if there was commercial production in any historical financial year then the facility is an existing facility and has a historical production variable.
- Clarifying that the landfill facility baseline calculation in subsection 30(1) refers to covered emissions.
- Clarifying that the Emissions Reduction Contribution (ERC) calculation for a trade-exposed baseline-adjusted (TEBA) facility is 1 for the 2022-23 financial year for the purpose of an application for a determination that a facility is a trade-exposed baseline-adjusted facility.
- Preventing facilities from being eligible for Safeguard Mechanism Credits (SMCs) in the first financial year of a trade-exposed baseline-adjusted (TEBA) determination, in which an exceedance over the hypothetical baseline is required for eligibility.
- Enabling a facility that drops below the Safeguard coverage threshold to postpone being an eligible facility for up to 3 years after the last covered financial year, and still receive SMCs for up to 10 financial years in total.
- Preventing a facility below the Safeguard coverage threshold from being eligible for SMCs if Australian carbon credit units (ACCUs) have been issued in either the current or previous financial year that are attributable to covered emissions reductions at that facility, to prevent a double-counting issue from arising in certain circumstances.

## Structure of the draft Amendment

The draft Amendment contains one schedule that amends the Safeguard Rules.

### Notes on clauses

#### Clause 1: Name

This clause provides for the draft Amendment, when enacted, to be cited as the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment (Production Variables Update) Rules (No. 2) 2023*.

## Clause 2: Commencement

The table in this clause provides for the commencement of the Schedule in the draft Amendment, which is on the day after it is registered.

## Clause 3: Authority

This clause states the authority under which this instrument is made.

## Clause 4: Schedules

This is a machinery clause that gives effect to the provisions in the Schedule to the draft Amendment according to its terms.

## Schedule 1—Amendments

### Outline

To enable the calculation of baselines under the Safeguard Mechanism reforms, this Schedule updates production variable definitions and ensures that each production variable and default emissions intensity value is robust and effective in the context of the Safeguard Mechanism reforms and declining baselines. Application and transitional provisions set out the implementation of the changes.

### Item 1 – Historical production variable with no associated emissions intensity determination and no best practice emissions intensity number

The definition of a baseline emissions number for an existing facility ( $EI_B$ ) is updated in section 11(1), so that if there is not a best practice emissions intensity number for the production variable for the financial year, and the production variable is a historical production variable for the facility and no emissions intensity determination is in place, the emissions intensity number for that facility's production variable would be zero. This would only apply to facilities that are able to, but do not, apply for an emissions intensity determination for a historical production variable, and where the best practice emissions intensity would normally apply but has not been set.

If the production variable for a facility is not a historical production variable and there is no emissions intensity determination in place or best practice emissions intensity number for the production variable for the financial year, then the default industry average emissions intensity number would still apply.

### Item 2 – Non-commercial production in a historical year

Section 12(2) is updated to improve consistency with the policy intent that if there was commercial production in any historical financial year, then the facility is an existing facility and has a historical production variable. This clarifies that production variables that were previously non-commercial, for example because of testing or piloting activities, should not be excluded from the definition of historical production variable for the purposes of defining an existing facility in section 12(2).

### Items 3 and 4 – Steel and emissions intensity determination applications

Normally an emissions intensity determination would apply (so long as an emissions intensity determination application has been submitted) to a production variable for a facility if the facility has engaged in commercial production of that production variable in the period between 1 July 2017 and 30 June 2030.

These items add new sections 14A and 19A to the Safeguard Rule to ensure that if an emissions intensity determination applies to “primary steel” for a facility, it also applies (with different

emissions intensities) to “primary iron” and “continuously cast carbon steel products and ingots of carbon steel (cold ferrous feed)” for that facility, even if “primary iron” and “continuously cast carbon steel products and ingots of carbon steel (cold ferrous feed)” are not historical, transitional or related production variables for the facility (as per paragraph 19(3)(a)).

These amendments prevent a facility from becoming worse off from entering into a process associated with the “primary iron” or “continuously cast carbon steel products and ingots of carbon steel (cold ferrous feed)” production variable. However, the emissions intensities corresponding to “primary iron” and “continuously cast carbon steel products and ingots of carbon steel (cold ferrous feed)” would differ from the emissions intensity corresponding to “primary steel”.

New section 14A states that if an application for an emissions intensity determination includes the primary steel production variable, the application also needs to provide information about the emissions intensity of iron production, and the emissions intensity of the conversion of that iron into steel. This section achieves this by specifying two ‘placeholder’ production variables: “primary iron (steelmaking)” which corresponds to iron production, and “ferrous feed (steelmaking)”, which corresponds to conversion of iron into steel. These placeholder PVs can then be linked to the equivalent, actual PVs in new section 19A.

New section 19A states that when the emissions intensity determination for primary steel is made, it would also specify emissions intensities for the primary iron production variable and the continuously cast carbon steel products and ingots of carbon steel (manufacture of primary iron carbon steel products from cold ferrous feed) production variable. The emissions intensities would be respectively based on the emissions intensity for the placeholder PVs for “primary iron (steelmaking)” and “ferrous feed (steelmaking)”, as set out in section 14A.

### **Item 5 – Note regarding facility-specific emissions intensity**

This item updates the note at subsection 20(6) to clarify that provisions that modify the definition of facility-specific emissions intensity number of a transitional production variable at subsection 20(6) now include subsection 92(2) for lithium hydroxide.

### **Item 6 – Reference to covered emissions in the landfill facility baseline calculation**

The landfill facility baseline calculation in subsection 30(1) is updated so that the definition of NLCH4 refers to “covered emissions” instead of “scope 1 emissions”, clarifying that the baseline should not include legacy emissions.

### **Item 7 – Reference to emissions reduction contribution (ERC) in s34(1)**

The equation in section 34(1) is amended to provide for the value of the ERC in the previous year ( $ERC_V$ ) to be 1 for a TEBA determination with a first adjusted financial year of 2023-24. This reflects that there is no ERC prior to 2023-24.

### **Items 8 and 9 – SMC eligibility in the first adjusted financial year of a TEBA determination**

This item clarifies that a facility cannot be eligible for SMCs in the first adjusted financial year of a TEBA determination, by adding a new subsection 56(5) regarding issuance of SMCs and a new subsection 57(5) for issuing SMCs for a declared multi-year period. Facilities with a TEBA determination could be eligible for SMCs in the subsequent years (second and third years) of the three-year TEBA determination period, but not the first year in which an exceedance over the hypothetical baseline is required for eligibility.

## Item 10 – ACCU issuance exclusion for eligible facilities

This item clarifies the meaning of eligible facility in section 58 to exclude a facility in the current financial year if any Australian carbon credit units (ACCUs) have been issued that are attributable to covered emissions reductions at the facility, and those ACCUs were issued in either the current or previous financial year.

Expanding the restriction of eligible facility definition for ACCU issuance to include the previous financial year issuances will prevent the double-crediting of SMCs in years that may be covered by the crediting period of the ACCU project but in which there are no ACCU issuances (for example, a project could be credited ACCUs for two financial years, with all of these ACCUs being issued in a single financial year). This exclusion is not required for facilities with covered emissions above the threshold of 100,000 because an increase in the net emissions number applies to such facilities but not to facilities with covered emissions below the threshold.

This item also clarifies that the exclusion for eligible facilities for ACCU issuance should be limited to ACCUs that are attributable to covered emissions. This aligns with other provisions preventing double-crediting such as section 72B 'Circumstances in which subsection 22XK(4) of the Act does not apply', and subsection 9(9) and section 20 of the *Carbon Credits (Carbon Farming Initiative) Rule 2015*. This would allow facilities at which there are ACCU projects that are only issued ACCUs for activities that reduce non-covered emissions such as scope 2 emissions (electricity consumption) to be considered eligible facilities.

## Item 11 – Timing change for definition of eligible facilities in s58

This item enables a facility that drops below the Safeguard coverage threshold to postpone being an eligible facility for up to 3 years after the last covered financial year, and still receive SMCs for up to 10 financial years in total. The facility must not receive SMCs (by being an eligible facility and applying for SMCs) for the period up to 3 years after the last covered financial year. The intent is to incentivise emissions reduction projects and allow facilities that were previously designated large facilities to be able to receive SMCs for 10 years if they engage in a decarbonisation project that has significant lead times (e.g. up to three years).

For example, a facility was a designated large facility in 2023-24 and the previous four financial years, but not in any subsequent years. The facility was not issued any SMCs in relation to 2024-25, 2025-26 or 2026-27, therefore they may be an eligible facility in the 10 financial years from 2027-28 to 2036-37.

## Item 12 – transition provision for default emissions intensities

This item removes the application and transition provision in subsection 91(1) that is superseded by this Amendment Rule, which relates to the default emissions intensities in force immediately after the commencement of Schedule 1 to the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment (Production Variables Update) Rules 2023*.

## Item 13 – transition provision for default emissions intensities

This item adds a new application and transition provision to clarify that updates to metrics and default emissions intensities added by this instrument would apply for the purpose of setting baseline emissions numbers for the financial year beginning on 1 July 2023.

This item also adds a provision that provides the facility-specific emissions intensity number for lithium hydroxide if it is a transitional production variable for a facility.

## Item 14 – Sodium cyanide

This item updates the activity definition for producing sodium cyanide so that it no longer requires caustic soda (sodium hydroxide) to be produced at the facility. This reflects production from the main Safeguard-covered facility that produces sodium cyanide and is consistent with how the default emissions intensity was set.

## Item 17 and 18 – Lithium ore mining

Item 17 inserts a new production variable, lithium ore, and the corresponding default emissions intensity into Schedule 1 of the Safeguard Rule. This new production variable would apply to facilities that conduct lithium ore mining through the physical extraction of lithium bearing minerals. It is intended to differentiate the mining of lithium ore from the run-of-mine metal ore production variable and ensure consistent treatment with bauxite, manganese ore and iron ore.

Item 18 ensures that there is no overlap in application of the lithium ore production variable and the run of mine metal ore PV.

## Best practice emissions intensity values

### Item 15 – Coal mining best practice emissions intensity

This item inserts a best practice emissions intensity value for run of mine coal. The benchmark is based on the top 10% of Australian industry performance, as Australian mines were found to be less emissions-intensive than overseas mines with suitable, high-quality data.

### Item 16 – Iron ore best practice emissions intensity

This item inserts a best practice emissions intensity value for run of mine iron ore. The benchmark is based on a weighted average of the emissions-intensity of iron ore mines in Australia and Brazil. These were found to be the least emissions-intensive mines globally with suitable, high-quality data.

### Item 19 – Run-of-mine metal ore best practice emissions intensity

This item inserts a best practice emissions intensity value for run of mine metal ore. The benchmark is based on the top 10% of Australian industry performance, as Australian mines were found to be less emissions-intensive than overseas mines with suitable, high-quality data.

### Item 20 – Extracted oil and gas best practice emissions intensity

This item inserts a best practice emissions intensity value for extracted oil and gas. The benchmark is based on a weighted average of the emissions-intensity of oil and gas extraction facilities in Norway and the UK. These were found to be the least emissions-intensive sites globally with suitable, high-quality data.

### Item 21 – Stabilised crude oil and condensate (stabilisation only) best practice emissions intensity

This item inserts a best practice emissions intensity value for stabilised crude oil and condensate (stabilisation only). The benchmark is based on the top 10% of Australian industry performance, as Australian sites were found to be less emissions-intensive than overseas sites with suitable, high-quality data.



## Item 22 – Stabilised crude oil (integrated extraction and stabilisation) best practice emissions intensity

This item inserts a best practice emissions intensity value for stabilised crude oil (integrated extraction and stabilisation). The benchmark is calculated as the sum of the international best practice best practice emissions intensity values for stabilised crude oil and condensate (stabilisation only) and extracted oil and gas.

Suitable data was found for US facilities with lower emissions intensities, however, these values were not used as publishing a lower value for integrated extraction and stabilisation compared with stabilisation only could create incentives for businesses to redefine their facility boundary to increase their baseline.

## Item 23 – Processed natural gas (processing only) best practice emissions intensity

This item inserts a best practice emissions intensity value for processed natural gas (processing only). The benchmark is based on a weighted average of the emissions-intensity of gas processing plants in Norway. These were found to be the least emissions-intensive sites globally with suitable, high-quality data.

## Item 24 – Processed natural gas (integrated extraction and processing) best practice emissions intensity

This item inserts a best practice emissions intensity value for processed natural gas (integrated extraction and processing). The benchmark is based on a weighted average of the emissions-intensity of gas processing plants in Norway and the UK. These were found to be the least emissions-intensive sites globally with suitable, high-quality data.

## Item 25 – Liquefied natural gas (from unprocessed natural gas) best practice emissions intensity

This item inserts a best practice emissions intensity value for liquefied natural gas (from unprocessed natural gas). The benchmark is calculated as the sum of international best practice values for natural gas processing (integrated) and the transformation of natural gas to liquefied natural gas (LNG).

The top 10% of Australian data was not used as a fallback, as it would have resulted in a best practice emissions intensity value for integrated LNG (including gas processing and liquefaction) that was lower than the best practice emissions intensity value for LNG processing only. This could create an incentive for businesses to redefine their facility boundary to increase their baseline.

## Item 26 – Liquefied natural gas (from processed natural gas) best practice emissions intensity

This item inserts a best practice emissions intensity value for liquefied natural gas (from processed natural gas). The benchmark is based on a weighted average of the emissions-intensity of gas processing plants in the US. These were found to be the least emissions-intensive sites globally with suitable, high-quality data.

## Item 27 – Ethane default and best practice emissions intensity

This item inserts a default emissions intensity value and best practice emissions intensity value for ethane. The best practice emissions intensity value is based on the top 10% of Australian industry performance, as suitable, high-quality data could not be found globally for ethane. The key challenge related to accurately apportioning emissions among outputs at a gas processing plant.



## Item 28 – Liquefied petroleum gas best practice emissions intensity

This item inserts a best practice emissions intensity value for liquefied petroleum gas. The benchmark is based on the top 10% of Australian industry performance, as suitable, high-quality data could not be found globally for LPG. The key challenge related to accurately apportioning emissions among outputs at a gas processing plant.

## Item 29 – Reservoir CO<sub>2</sub> from existing gas fields best practice emissions intensity

This item inserts a best practice emissions intensity value for reservoir CO<sub>2</sub> that will apply to new facilities or new production using the production variable at section 35 of Schedule 1. The benchmark is based on a weighted average of carbon capture and storage rates for facilities in Norway. These were found to be the least emissions-intensive sites globally with suitable, high-quality data.

### *Other best practice emissions intensity values*

Production variables that have best practice emissions intensity values inserted through other sections of this Amendment Rule include:

- Primary iron (section 32)
- Iron ore pellets (section 33)
- Bulk freight road transport (section 47)
- Electricity generation (section 48)
- Lithium hydroxide (section 63)
- Gaseous hydrogen (section 64)
- Liquefied hydrogen (section 64)
- Mine rehabilitation (section 64)

## Steel production variables overview

In Part 20 of Schedule 1 of the Safeguard Rule, there were 12 production variables related to steel manufacturing. Items 30 to 46 of the Amendment update the steel production variables to accommodate technologies that can be used to reduce the emissions intensity of steel production, including new ways of making steel. The result is a new total of 11 production variables related to steel manufacturing.

The following are removed:

- The definition of Integrated iron and steel manufacturing
- The Iron ore sinter (integrated iron and steel manufacturing) production variable
- The Iron ore pellets (not integrated iron and steel manufacturing) production variable

## Item 30 – Definition of the activity of integrated iron and steel manufacturing

This item removes subsection 36(1) which defines the activity of integrated iron and steel manufacturing and renumbers the remaining subsections in section 36.

## Item 31 – Coke oven coke

This item replaces “Coke oven coke (integrated iron and steel manufacturing)” with “Coke oven coke”. The production variable only applies to coke oven coke that is exported from the facility, and the facility would no longer be required to be conducting the integrated iron and steel manufacturing activity.

Many ways of reducing the emissions intensity of steel production involve using less coke (an intermediate product) to make the steel. Previously, facilities would get a lower baseline for reducing their coke production, which disincentivises these approaches. In order to address this, the new production variable only applies to coke that is exported from the facility. The emissions associated with the production of coke oven coke that is not exported would be associated with “Primary steel”.

### Item 32 – Lime (steel manufacturing)

This item replaces “Lime (integrated iron and steel manufacturing)” with “Lime (steel manufacturing)”. The production variable only applies to lime that is exported from the facility, and the facility would no longer be required to be conducting the integrated iron and steel manufacturing activity. This is an intermediate product used for steel production, and the emissions associated with the production of lime that is not exported would be associated with “Primary steel”.

### Item 33 – Iron ore sinter and primary iron

This item removes the iron ore sinter production variable and inserts a new production variable, primary iron, at section 29 of Schedule 1.

Iron ore sinter is an intermediate product used for steel production, and the emissions associated with the production of iron ore sinter would be associated with the new primary steel production variable.

Primary iron is an intermediate product used in the production of primary steel, but in some cases can be produced separately and exported from the facility. This production variable only applies to primary iron that is exported from the facility. The metric is tonnes of metallic iron products that are exported from the facility. To account for the varying impurity levels in crude iron products, the quantity of metallic iron production is taken to not include gangue content. Gangue consists of commercially worthless impurities such as silica ( $\text{SiO}_2$ ), calcium oxide ( $\text{CaO}$ ), magnesium oxide ( $\text{MgO}$ ) and aluminium oxide ( $\text{Al}_2\text{O}_3$ ).

The metric for this production variable is reduced when metallic iron is produced from coke oven coke imported to the facility. Without this change, if a facility were to produce metallic iron using coke oven coke imported to the facility, its emissions would be reduced (with its baseline unchanged), but there would be emissions elsewhere to produce the coke. There is accordingly a multiplier applied to each tonne of metallic iron produced from coke oven coke imported to the facility, which was calculated using data from Australian steelmaking facilities.

This item also inserts the international best practice emissions intensity value for primary iron. The benchmark is based on the top 10% of Australian industry performance, as suitable, high-quality data could not be found globally for primary iron.

### Item 34 – Iron ore pellets

This item inserts the production variable “Iron ore pellets”, replacing “Iron ore pellets (integrated iron and steel manufacturing) (s40)” and “Iron ore pellets (s47)” (refer to section 45 of the Amendment Rule). This single production variable only applies to iron ore pellets that are exported from the facility, and the facility would no longer be required to be conducting the integrated iron and steel manufacturing activity. This is an intermediate product used for steel production and iron production, and the emissions associated with the production of iron ore pellets that is not exported would be associated with “Primary steel” or “Primary iron”.

This item also inserts the international best practice emissions intensity value for iron ore pellets. The benchmark is based on the top 10% of Australian industry performance, as suitable, high-quality data could not be found globally for iron ore pellets.

### Item 35 – Continuously cast carbon steel products and ingots of carbon steel (primary steel)

This item updates the heading for Division 6 of Part 20 of Schedule 1 to “Continuously cast carbon steel products and ingots of carbon steel from primary steel manufacturing”, reflecting the move away from referring to “integrated iron and steel manufacturing”.

### Item 36 – Primary steel

This item replaces the “Continuously cast carbon steel products and ingots of carbon steel (integrated iron and steel manufacturing)” production variable with the primary steel production variable.

The metric for this production variable is reduced when steel is produced from coke oven coke imported to the facility. Without this change, if a facility were to produce steel using coke oven coke imported to the facility, its emissions would be reduced (with its baseline unchanged), but there would be emissions elsewhere to produce the coke. There is accordingly a multiplier applied to each tonne of steel produced from coke oven coke imported to the facility, which was calculated using data from Australian steelmaking facilities.

Steel is typically made through an integrated process that processes iron ore (rocks rich in iron oxides) into iron ore sinter or iron ore pellets, and adds the processed iron ore, along with coke oven coke (also referred to as just “coke”) and lime (which helps to remove impurities) to a blast furnace. This reduces the iron oxides in the ore to produce elemental iron in a form known as crude iron or pig iron. The crude iron has a high carbon content (typically 3.8-4.7%) and impurities that result in it being brittle. Molten crude iron exits the blast furnace and enters a basic oxygen furnace, which mixes oxygen with the molten iron to reduce its carbon content. Additives such as lime are also added to the basic oxygen furnace to reduce impurities. Molten steel exits the basic oxygen furnace, and it is cast into ingots of steel. The “primary steel” production variable would cover this process.

### Items 37 and 38 – Hot rolled long products (primary steel)

This item updates the hot-rolled long products produced at integrated iron and steel manufacturing facilities production variable.

### Items 39 and 40 – Hot rolled flat products (primary steel)

This item updates the hot-rolled flat products produced at integrated iron and steel manufacturing facilities production variable.

### Item 41 – Continuously cast carbon steel products and ingots of carbon steel (cold ferrous feed)

This item updates the Continuously cast carbon steel products and ingots of carbon steel (manufacture of carbon steel products from cold ferrous feed) production variable.

### Items 42 and 43 – Hot rolled long products (cold ferrous feed)

This item updates the hot-rolled long products not produced at integrated iron and steel manufacturing facilities production variable.

## Items 44 and 45 – Hot rolled flat products (cold ferrous feed)

This item updates hot rolled flat production not produced at integrated iron and steel manufacturing facilities.

## Item 46 – Iron ore pellets

This item removes “Iron ore pellets (s47)”, which is replaced along with “Iron ore pellets (integrated iron and steel manufacturing) (s40)” by the production variable “Iron ore pellets” (refer to item 34 of the Amendment Rule). This single production variable only applies to iron ore pellets that are exported from the facility, and the facility would no longer be required to be conducting the integrated iron and steel manufacturing activity. This is an intermediate product used for steel production and iron production, and the emissions associated with the production of iron ore pellets that is not exported would be associated with “Primary steel” or “Primary iron”.

## Item 47 – Rail transport

The definition of rail transport is updated to make it more technology neutral. The original definition was restricted to rolling stock that combusts fuels onboard. The updated definition ensures that the rail sector production variable can apply to any technology for powering rolling stock, including new technologies that enable rail companies to reduce their emissions, such as battery-electric or hydrogen power.

## Item 48 – Bulk freight road transport best practice emissions intensity

This item updates the bulk freight road transport production variable with the best practice emissions intensity value. The benchmark is set using data from the US Environment Protection Agency, which includes facility level bulk freight road transport data.

## Item 49 – Electricity generation best practice emissions intensity

This item sets a best practice emissions intensity value for the electricity generation production variable. The benchmark is based on the top 10% of Australian industry performance, as suitable, high-quality data could not be found globally for on-site electricity generation. Facilities were drawn from a range of sectors, including some from oil and gas, some from mining and some from manufacturing, to ensure the value is representative.

## Items 50 and 51 – Reference to prescribed production variables for clinker and cement

These sections removed reference to “prescribed” in relation to the production variables for clinker and cement.

## Item 52 – Refined lead

This item inserts a new default emissions intensity value for the refined lead production variable. This value has been calculated using representative data. The value has been calculated using contemporaneous data given that operation of facilities in the Australian industry has changed significantly since the previous value was calculated.

## Item 53 – Zinc in fume

This item replaces the default emissions intensity for the zinc in fume production variable. This value has been calculated using representative data. The value has been calculated using contemporaneous data given that operation of facilities in the Australian industry has changed significantly since the previous value was calculated.

## Item 54 – Intermediate nickel products

This item updates the definition of intermediate nickel products to include mixed nickel-cobalt hydroxide precipitate that has a concentration of nickel between 20% and 47% (inclusive) by mass. The concentration of nickel was previously required to be between 35% and 47% (inclusive) by mass. This change will allow a nickel producer to use the “intermediate nickel products from nickel bearing inputs” production variable. The metric for this production variable is “tonnes of 100% equivalent nickel” rather than the tonnes of the nickel product itself, and as such it remains a suitable basis for setting baselines that reflect emissions per unit of production.

## Item 55 - Newsprint

This item inserts a new default emissions intensity value for newsprint manufacturing. The new value has been calculated using contemporaneous data given that the number of facilities operating in Australia has changed significantly since the previous value was calculated.

## Item 56 – Ethene (Ethylene)

This item replaces the default emissions intensity for the ethene (ethylene) production variable. This value has been calculated using representative data. The value has updated to reflect that some emissions previously apportioned to ethene (ethylene) are now apportioned to exported steam related to the ethene production variable.

## Item 57 – Polyethylene

This item replaces the default emissions intensity for the polyethylene production variable. This value has been calculated using representative data. The value has been updated to reflect that some emissions previously apportioned to polyethylene are now apportioned to exported steam related to the ethene production variable.

## Item 58 – Exported steam related to the ethene production activity

This item inserts a new production variable, exported steam related to the ethene production activity, and the corresponding default emissions intensity into Schedule 1 of the Safeguard Rule. This new production variable is intended to apply to facilities which produce ethene (ethylene) and export steam.

Steam is ordinarily an intermediate product and has associated emissions included in the relevant output-based production variable under the Safeguard Mechanism. An alternate approach may be required where steam is produced with the explicit purpose of export, rather than as an input for a production variable. Particularly when emissions associated with exported steam are a significant portion of a facility’s emissions profile, and where the production of steam for export is non-linear with the production of the facility’s other production variables. In this case, it is appropriate that a production variable for exported steam is available to reflect the fact that one or more facilities are producing steam for export to fill a commercial demand.

Access to an exported steam production variable would be not appropriate if it is incidental to usual activity or a by-product of a facility’s primary product. In these cases, it is appropriate for the emissions associated with exported steam to be included in the relevant output-based production variable. By default, any emissions associated with exported steam have been included in the default emissions intensity calculation of the associated output-based production variable.

Because of this, use of an exported steam production variable should be limited to facilities structured such that steam is intended to be exported to another facility under ordinary operating

conditions, and which have had the industry average emissions intensity values of their other production variables calculated without the emissions associated with export steam.

Facilities in the ethylene producing sector have a demonstrated need for an exported steam production variable. The primary production variables of the sector, ethylene and polyethylene, have had their default emissions intensity values recalculated to exclude emissions associated with exported steam and are updated in this set of amendments. The Safeguard Rule also includes a production variable for exported steam related to the raw sugar manufacturing activity.

This item includes a note on the measurement of steam and guidance on how measurement should be converted to gigajoules in accordance with standard thermodynamic principles.

### Item 59 – Exported steam related to the raw sugar manufacturing activity

This item inserts a note on the measurement of steam and guidance on how measurement should be converted to gigajoules in accordance with standard thermodynamic principles. This note is consistent with the note that has been added by item 58.

### Items 60 to 63 – Petroleum refining and renewable and waste feedstocks

The petroleum refining production variable is amended to include renewable and waste feedstocks, allowing for a broader range of feedstocks to be refined alongside petroleum-based feedstocks. This may result in ‘blended’ products from a petroleum refinery, where products are made from refining both petroleum feedstocks and renewable and/or waste feedstocks.

### Items 64 and 65 – Petroleum refining default emissions intensity

This item updates the default emissions intensity value for the petroleum refining production variable to reflect the increase in emissions intensity at petroleum refineries due to producing petrol that complies with a 10 ppm sulfur limit (*Fuel Quality Standards (Petrol) Determination 2019*). This updated default emissions intensity value would apply from the start of the financial year in which compliance with the more stringent sulfur limit is achieved.

### Item 66 – Lithium Hydroxide

This item inserts the default emissions intensity for the lithium hydroxide production variable. There are a small number of facilities operating in Australia, none of which have reached stable production. Therefore, this emissions intensity has been calculated using forecast and estimated data in line with the supplementary approach<sup>1</sup>, with advice on data suitability provided by an independent technical expert.

This item inserts the best practice emissions intensity value for lithium hydroxide. The benchmark is based on a supplementary approach using forecast data for current or planned Australian facilities, as Australian sites were found to be less emissions-intensive than overseas sites with suitable, high-quality data.

### Item 67 – New production variables for hydrogen, mine rehabilitation and biofuels

This item inserts five new production variables under the categories of hydrogen, mine rehabilitation and biofuels.

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<sup>1</sup> Framework for developing default production variables and emissions-intensity values: [Safeguard Mechanism - DCCEEW](#)

## Hydrogen

A new Part 48 is inserted to Schedule 1 of the Safeguard Rule, containing new production variables for gaseous hydrogen and liquefied hydrogen, and the corresponding international best practice emissions intensity values. The benchmarks are based on a supplementary approach as suitable global data was not available. The supplementary approach uses an engineered value based on gas-fuelled, steam methane reforming technology, which was assessed as being the lowest emissions-intensity commercial production (that is, not a pilot or demonstration plant and not receiving significant subsidies).

A default value is not required given there is no existing Australian facility producing hydrogen as an output.

The hydrogen production variables are intended to apply to facilities where the final product is either gaseous or liquid hydrogen. Some existing facilities produce hydrogen as a by-product or produce and use hydrogen in their facility to make their final output. The intent is that these new hydrogen production variables would not apply to those situations, as the emissions from producing hydrogen have already been accounted for in existing production variables (e.g. ammonia and petroleum refining). If a facility produces liquefied hydrogen, only the liquefied hydrogen production variable would apply, not the gaseous hydrogen production variable. The liquefied hydrogen production variable includes the emissions of producing the gaseous hydrogen.

## Mine rehabilitation

A new Part 49 is inserted to Schedule 1, containing the new mine rehabilitation production variable, and the corresponding default and best practice emissions intensities, is inserted as a new production variable into Schedule 1 of the Safeguard Rule. The current mining production variables already include emissions from progressive and continuous rehabilitation. This new production variable is principally intended to apply at the end of a mine's life following cessation of production, or circumstances where rehabilitation activities go beyond business as usual such as rehabilitation of an entire pit, or rehabilitation ramping up as production drops towards mine closure.

The mine rehabilitation production variable uses an input metric for the production variable because rehabilitation activity differs greatly between facilities, resulting in different fuel burn rates for equipment, comparative scale of activity and mix of activities such as haulage, shaping and revegetation. There is also no clear production output of the mine rehabilitation activity. By using an energy input, with an emissions intensity based on diesel combustion, the comparative differences between rehabilitation activities at facilities are accounted for. This production variable is closely linked to other mining production variables for any facility to which it applies because the same equipment used for mining is typically used in rehabilitation activities. The baseline decline rate will create an incentive to reduce emissions at a mine site, though lower emissions fuels and technology. The best practice emissions intensity value for mine rehabilitation is the same as the default emissions intensity, based on the characteristics of operating mine facilities, where diesel remains the primary energy input for vehicle-based operations.

## Biofuels

'Biofuel', 'biofuel production activity' and 'biofuel feedstocks' are defined in a new section 102 to provide for the new renewable aviation kerosene and renewable diesel production variables. They are intended to capture feedstocks that are non-fossilised and biodegradable organic material originating from plants and micro-organisms (i.e. not petroleum-based feedstocks).



Renewable aviation kerosene is inserted as a new production variable into Schedule 1 of the Safeguard Rule. The metric is kilolitres and it is defined as per the *National Greenhouse and Energy Reporting Regulations 2008*. This production variable is intended to apply to facilities that refine biofuel feedstocks only, with no petroleum feedstock refined, resulting in renewable aviation kerosene product. This contrasts with the petroleum refining production variable, which captures both petroleum-based feedstocks and some biofuel feedstocks.

Renewable diesel is inserted as a new production variable into Schedule 1 of the Safeguard Rule. The metric is kilolitres and it is defined as per the *National Greenhouse and Energy Reporting Regulations 2008*. This production variable is intended to apply to facilities that refine biofuel feedstocks only, with no petroleum feedstock refined, resulting in renewable diesel product. This contrasts with the petroleum refining production variable, which captures both petroleum-based feedstocks and some biofuel feedstocks.

### Item 68 – Trade exposed production variables (manufacturing)

Production variables are determined to be trade-exposed if the trade share is above 10 per cent. Trade share is calculated as the value of imports and exports, divided by the value of domestic production. The following production variables are added to the list of trade-exposed production variables that are also manufacturing production variables in Schedule 2 of the Safeguard Rule:

- Renewable aviation kerosene
- Renewable diesel
- Gaseous hydrogen
- Liquefied hydrogen
- Primary iron
- Primary steel

### Item 69 – Trade exposed production variables (non-manufacturing)

The lithium ore production variable is added to the list of trade-exposed production variables that are not manufacturing production variables in Schedule 2 of the Safeguard Rule.

Feedback is sought on the draft provisions in Schedule 1.

## Comparison to UNEP's Metcoal Methane Partnership and Oil and Gas Methane Partnership 2.0

For coal, the UNEP Metcoal Methane Partnership sets a 2030 performance target of between one and three tonnes of methane per kilotonne of marketed metallurgical coal, which is equivalent 0.028 to 0.084 t CO<sub>2</sub>-e per tonne saleable coal. Although the units are not equivalent to the run-of-mine coal production variable, the proposed best practice emissions intensity value of 0.00592 is far more stringent. It is also more stringent given it encompasses other greenhouse gases (carbon dioxide and nitrous oxide), applies on a run-of-mine basis, and, in 2030, the cumulative emissions reduction contribution under the ordinary operation of the Safeguard Rule will be a decline of 34%.

For the oil and gas sector, the Oil and Gas Methane Partnership 2.0 promotes two targets.

The first target is an absolute reduction target of 45% on 2015 levels by 2025 and 60-75% reduction by 2030. Since the Safeguard production variables cover all emissions, not just methane, a practical approach is to compare the default emissions intensity values for relevant oil and gas production variables with the benchmarks that will apply in 2025 and 2030 respectively.

- The default emissions intensity values were generally determined from data from 2012-13 to 2016-17. If we assume the default values represent the emissions intensity at the midpoint of this time period – 2014-15 – we can compare the change from the default in 2025 and 2030. The benchmarks will apply from 2023-24 and be subject to the default decline rate of 4.9% per year. This means that the benchmark value in 2023-24 is effectively reduced by 4.9%; in 2024-25 this increases to a 9.8% reduction on the published benchmark and in 2029-30 this increases to a 34% reduction under the ordinary operation of the Safeguard Rule.
- Comparing the relevant default value to the declined values of the relevant benchmarks in 2024-25 (for example, for extracted oil and gas the default value is 0.000376 and the proposed best practice emissions intensity value is 0.0000101, for processed natural gas (integrated extraction and processing) the default value is 0.00275 and the proposed best practice emissions intensity value is 0.000319), and the resulting reduction is between 90% and 98% of the default value. When repeating the comparison for the declined values of the relevant benchmarks in 2029-30, the resulting reduction is between 93% and 98% of the default value. The analysis shows that the total scope 1 emissions intensity reduction (in CO<sub>2</sub>-e) required by the benchmarks is larger than the emissions intensity reduction required by the OGMP 2.0 of 45% in 2025 and 60-75% in 2030, noting these targets only apply to methane emissions.

The second target, is an industry-led initiative to reduce upstream methane emissions to below 0.2% of marketed gas by 2025 and near zero by 2030, compared to the international average of methane emissions of 0.3% of marketable gas in 2017.

- For the analysis of how the best practice benchmarks compare to this target, the standard is interpreted to represent a 33% reduction in methane emissions from 2017 to 2025 (i.e. the difference between 0.3% in 2017 and 0.2% in 2025). The analysis for the first target is relevant and shows the overall reductions of 90% of covered emissions under the Safeguard benchmarks compared to the default values is more stringent than the 33% reduction in methane emissions required by the industry-led initiative.